SYNTHESIS, CHARACTERIZATION AND CONTROLLED RELEASE PROPERTIES OF MAGNESIUM ALUMINIUM LAYERED DOUBLE HYDROXIDE 4-CHLOROPHENOXYACETIC ACID NANOCOMPOSITE

NUR SUHANA BINTI MOHD ALI

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This Final Year Project entitled **Synthesis, Characterization And Controlled Release Properties Of Magnesium Aluminium Layered Double Hydroxide 4-Chlorophenoxyacetic Acid Nanocomposite"** was submitted by Nur Suhana binti Mohd Ali, in partial fulfilment of the requirement for the Degree of Bachelor of Science (Hons.) Chemistry, in faculty of Applied Sciences, and was approved.

Dr Tuan Sheikh Ahmad Izaddin Sheikh Mohd Ghazali
Supervisor
School of Chemistry and Environment Studies
Faculty of Applied Science
Universiti Teknologi Mara
72000 Kuala Pilah
Negeri Sembilan

Nurul Huda Abdul Halim
Project Coordinator
B. Sc. (Hons.) Chemistry
Faculty of Applied Science
Universiti Teknologi Mara
72000 Kuala Pilah
Negeri Sembilan

Mazni Musa
Programme Coordinator
School of Chemistry and
Environment Studies
Faculty of Applied Science
Universiti Teknologi Mara
72000 Kuala Pilah
Negeri Sembilan

Date : _____

TABLE OF CONTENTS

ABTRACT

SYNTHESIS, CHARACTERIZATION AND CONTROLLED RELEASE PROPERTIES OF MAGNESIUM ALUMINIUM LAYERED DOUBLE HYDROXIDE 4-CHLOROPHENOXYACETIC ACID NANOCOMPOSITE

Layered double hydroxide (LDH)-based nanohybrid, created by interacting LDH nanocomposite with another nanoparticles, are come out in active area for environmental protection, healthcare, and storage of drugs or herbicides. In this study, Herbicides, 4-chlorophenoxyacetic acid were intercalated into MgAl-layered double hydroxide (LDH) by using molar ratio 2 (R=2). It is synthesised via co-precipitation method at pH 10 (± 0.5). The intercalation compound (MgAl-4CPA), was characterised using PXRD and FTIR-ATR to confirm that guest anion are successfully intercalated into MgAl-LDH nanohybrids. The XRD pattern shows that at concentration 0.7 M, the basal spacing shift from 8.9 Å to 9.3 Å, which means the guest anion was successfully intercalated. The result supported by the FTIR-ATR spectrum that shows nitrate peak at wavenumber 1353.50 cm^{-1} disappeared and carboxylate ion (COO^-) band presence at wavenumber 1596.29 cm^{-1}. Meanwhile, the controlled release study of 4CPA from MgAl-LDH nanohybrids shows that carbonate aqueous salt solution released the percentage of 4CPA higher than tap water, which are 19.72 and 18.92 %, respectively. This study offered that controlled release of 4CPA from LDH can created safer agent of agrochemicals that can be used in agricultural fields.